



ZXM64P03X

## 30V P-CHANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

**V<sub>(BR)DSS</sub>=-30V; R<sub>DSON</sub>=0.075Ω; I<sub>D</sub>=-3.8A**

### DESCRIPTION

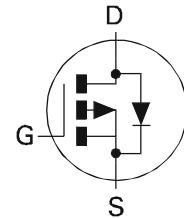
This new generation of high density MOSFETs from Zetex utilises a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



MSOP8

### FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

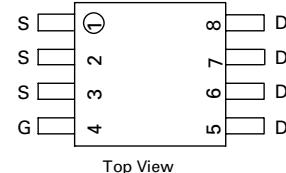


### APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

### ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64P03XTA	7	12mm embossed	1000 units
ZXM64P03XTC	13	12mm embossed	4000 units



### DEVICE MARKING

- ZXM4P03

# ZXM64P03X

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	-30	V
Gate- Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $V_{GS}=4.5V$ ; $T_A=25^\circ C$ )(b) ( $V_{GS}=4.5V$ ; $T_A=70^\circ C$ )(b)	$I_D$	-3.8 -3.0	A
Pulsed Drain Current (c)	$I_{DM}$	-19	A
Continuous Source Current (Body Diode)(b)	$I_S$	-2.3	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	-19	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	1.1 8.8	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	1.8 14.4	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	$^\circ C$

## THERMAL RESISTANCE

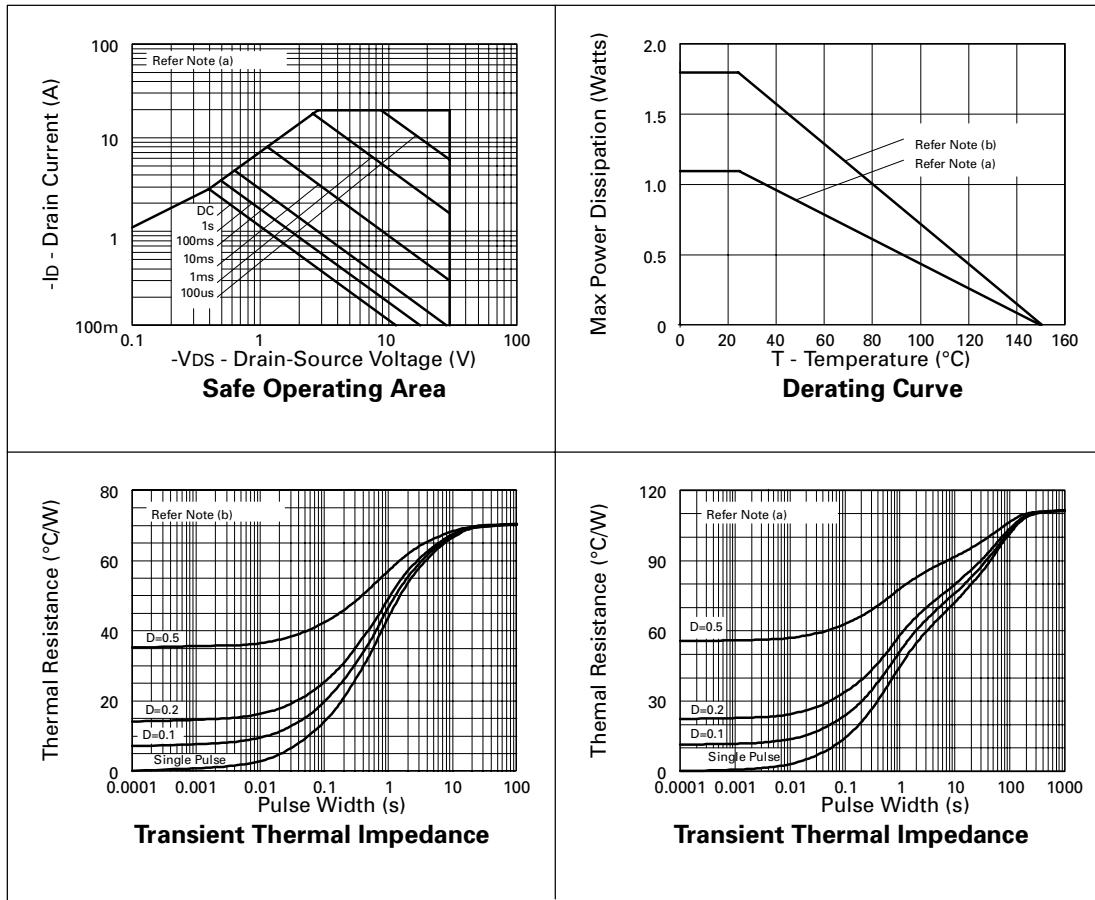
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	70	$^\circ C/W$

### NOTES

- (a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
- (b) For a device surface mounted on FR4 PCB measured at  $t \leq 10$  secs.
- (c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

# ZXM64P03X

## CHARACTERISTICS



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## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D=-250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			$\pm 100$	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	-1.0			V	$I_D=-250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(\text{on})}$			0.075 0.100	$\Omega$	$V_{GS}=-10\text{V}, I_D=-2.4\text{A}$ $V_{GS}=-4.5\text{V}, I_D=-1.2\text{A}$
Forward Transconductance (3)	$g_{fs}$	2.3			S	$V_{DS}=-10\text{V}, I_D=-1.2\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		825		pF	$V_{DS}=-25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$
Output Capacitance	$C_{oss}$		250		pF	
Reverse Transfer Capacitance	$C_{rss}$		80		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		4.4		ns	
Rise Time	$t_r$		6.2		ns	$V_{DD}=-15\text{V}, I_D=-2.4\text{A}$
Turn-Off Delay Time	$t_{d(off)}$		40		ns	$R_G=6.2\Omega, R_D=6.2\Omega$ (Refer to test circuit)
Fall Time	$t_f$		29.2		ns	
Total Gate Charge	$Q_g$		46	nC		$V_{DS}=-24\text{V}, V_{GS}=-10\text{V}, I_D=-2.4\text{A}$
Gate-Source Charge	$Q_{gs}$		9	nC		(Refer to test circuit)
Gate Drain Charge	$Q_{gd}$		11.5	nC		
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			-0.95	V	$T_j=25^\circ\text{C}, I_S=-2.4\text{A}, V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		30.2		ns	$T_j=25^\circ\text{C}, I_F=-2.4\text{A}, dI/dt= 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		27.8		nC	

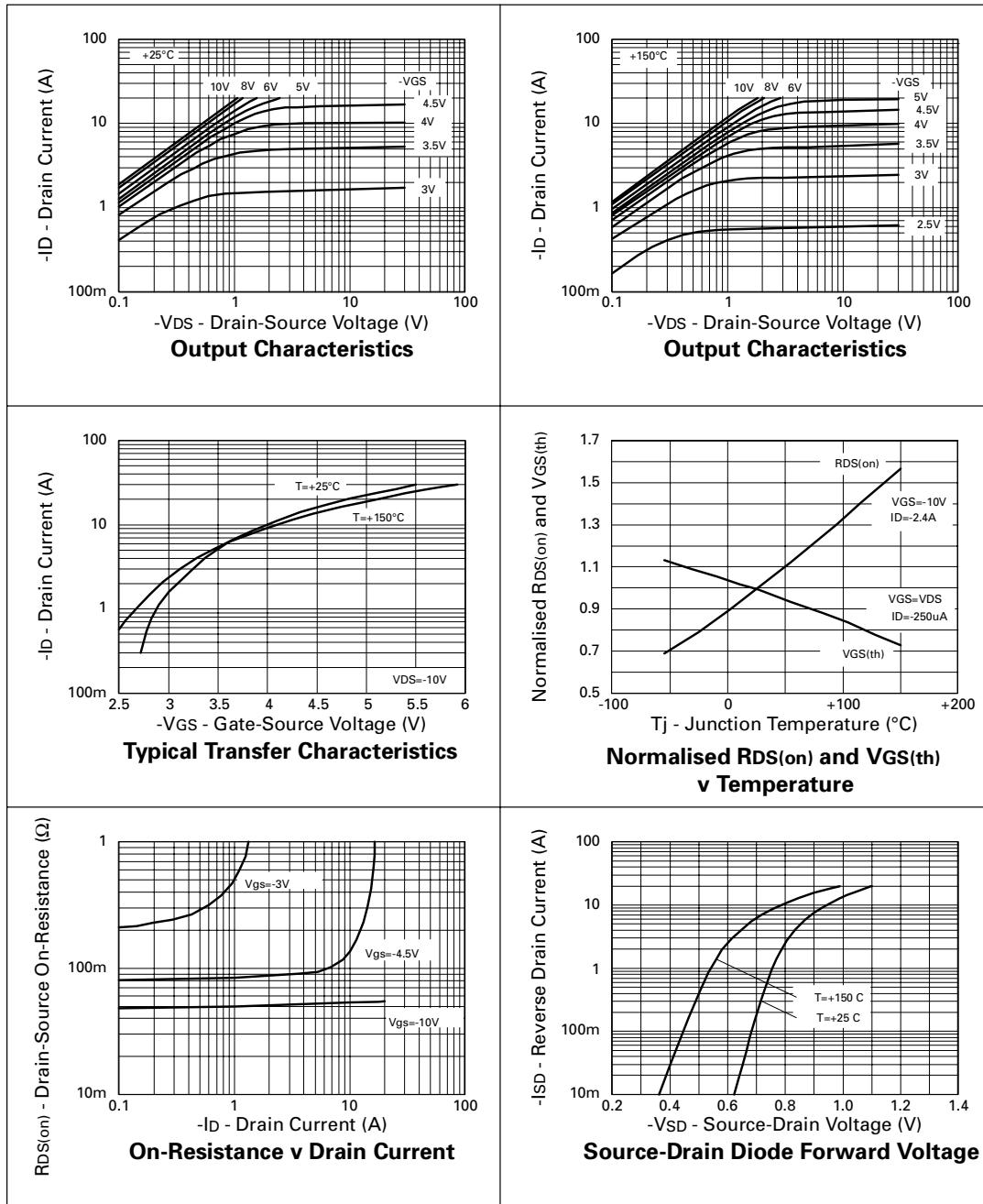
(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

(2) Switching characteristics are independent of operating junction temperature.

(3) For design aid only, not subject to production testing.

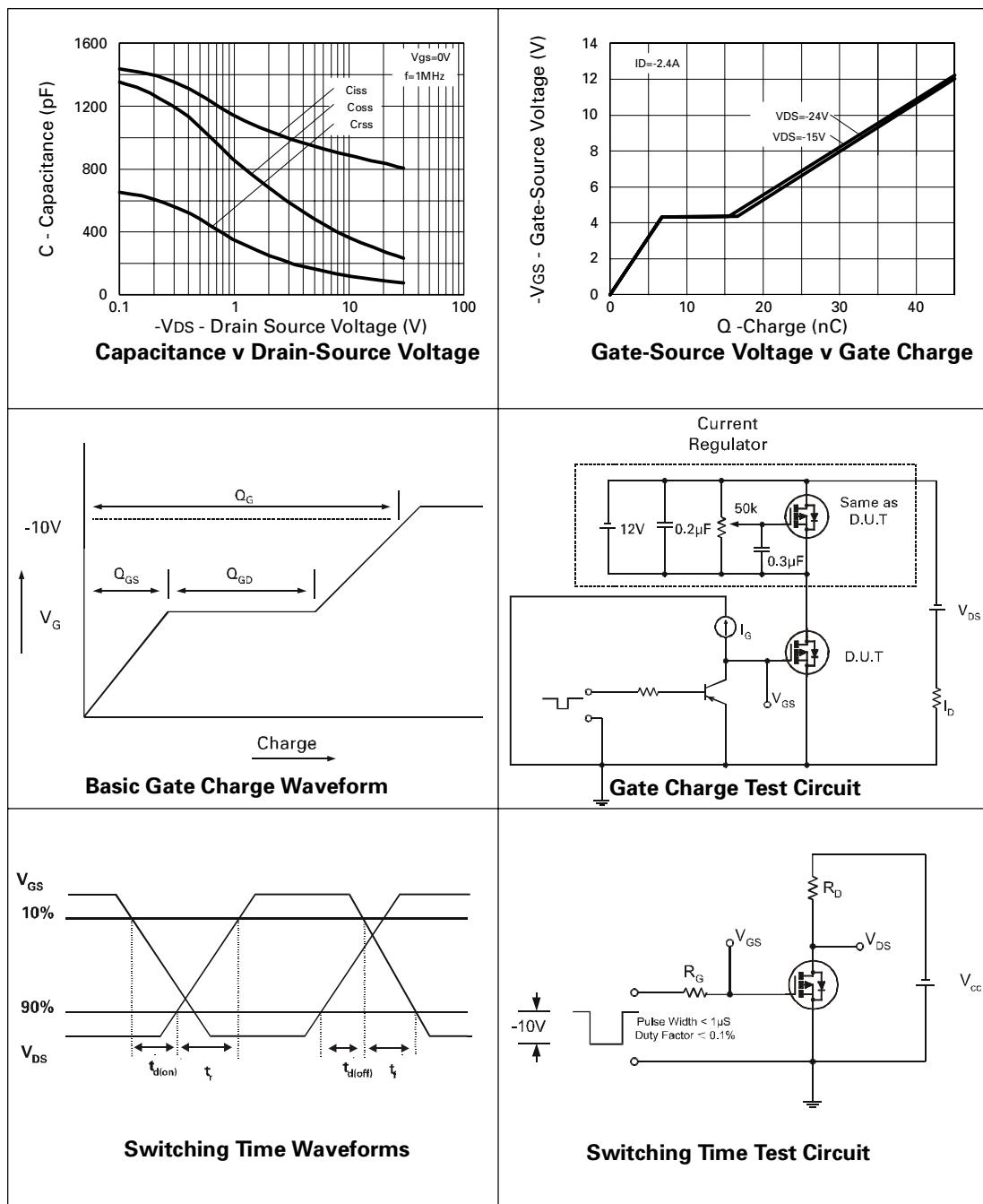
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## TYPICAL CHARACTERISTICS



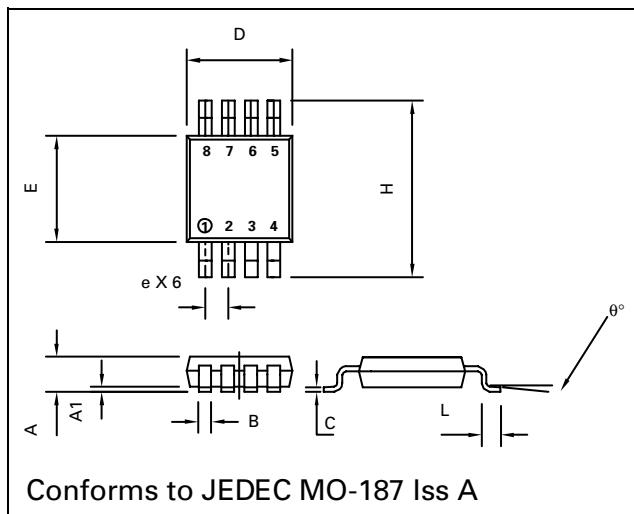
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## TYPICAL CHARACTERISTICS



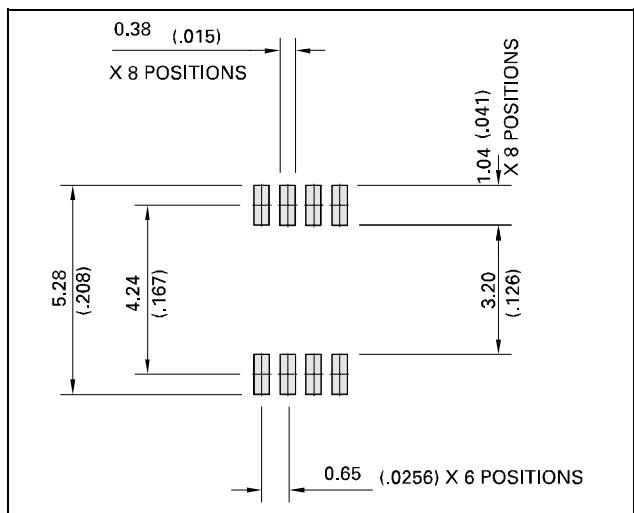
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## PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	MIN	MAX	MIN	MAX
A		1.10		0.043
A1	0.05	0.15	0.002	0.006
B	0.25	0.40	0.010	0.016
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
e	0.65	BSC	0.0256	BSC
E	2.90	3.10	0.114	0.122
H	4.90	BSC	0.193	BSC
L	0.40	0.70	0.016	0.028
q°	0°	6°	0°	6°

## PAD LAYOUT DETAILS



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